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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,651	12/21/2001	Yutaka Kaneda	111426	6403
25944	7590	10/29/2003		
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			ART UNIT 2827	PAPER NUMBER

DATE MAILED: 10/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
10/023,851	KANEDA, YUTAKA	
Examiner	Art Unit	
Ishwar (I. B.) Patel	2827	

~ The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-17 is/are pending in the application.
- 4a) Of the above claim(s) 1, 6, 7, 10, 11 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-5, 8, 12-14, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claim 2 have been considered but are moot in view of the new ground(s) of rejection.

New secondary art of Castro, Forehand and Hugle disclose guide holes on individual circuit boards for aligning / registration in subsequent processing.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 8, 14 and 17 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 8 is claiming guide holes for positioning. Claim is directly or indirectly depending upon claim 2, which is claiming a guide holes. It is not clear whether the applicant is claiming any other structure of guide holes than those claimed in claim 2.

Regarding claim 14, "to the wiring pattern" at the end of the claim is not clear. Is it a typographical mistake and to be deleted or is referring to one of the wiring pattern

claimed. If first is correct than the claim will be acceptable after canceling " to the wiring pattern", if the later is correct, it is not clear what wiring pattern is referred.

Regarding claim 17, "the reinforcing guide pattern is formed integral with the wiring pattern on the insulating substrate" is not clear.

Whether, "formed integral" is used as method step indicating the wiring pattern and reinforcing patterns are formed at the same step or reinforcing wiring pattern is connected to the wiring pattern. If first is correct the claim is acceptable, if later is correct, the frame is not connected with the wiring patent as shown in figure 2e, at the end of the process steps.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-5, 8, 13 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by F. Hugle, US Patent No. 3,440,027.

Regarding claim 2, Hugle discloses a flexible wiring board comprising a wiring pattern formed of a desired metal on an insulating substrate (wire 5 on flexible insulating layer 2, see figure 1 and 2, column 1, line 70 to column 2, line 30), and

a reinforcing guide pattern on the insulating substrate, wherein the reinforcing guide pattern is of the same metal as that of the wiring pattern and wherein the reinforcing guide pattern has guide holes for positioning (metal strip 7 with indexing holes 6, see figure 1, line 70 to column 2, line 30).

Regarding claim 3, Hugle further discloses the guide pattern has a projecting reinforcing guide having a thickness greater than that of the wiring pattern (metal strip 7 is thicker than the wiring 5, see figure 2).

Regarding claim 4 and 5, Hugle further discloses the guide pattern formed as a frame shape surrounding the periphery of the wiring pattern, (metal strip 7 on the periphery of the wiring 5, see figure 1).

Regarding claim 8, Hugle further discloses the guide pattern with guide holes for positioning as applied to claim 2 above.

Regarding claim 13, Hugle further discloses the wiring pattern has flat electrodes, see figure 3, end of wiring used as terminal is flat.

Regarding claim 17, Hugle further discloses the reinforcing guide pattern is formed integral with the wiring pattern on the insulating substrate.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hugle, as applied to claims 2-5, 8, 13 and 17 above, and further in view of Galli et al., US Patent No. 3,781,596, hereafter, Galli.

Regarding claim 12, the applicant is claiming wiring pattern with projecting electrodes.

Hugle fails to disclose the projecting electrodes.

Galli discloses wiring patterns (12) with projecting electrodes (13), see figure 1a and 1b, column 2, line 5-7, and further discloses that the conductor patterns 12 may be of the same or different conductor material as the pads 13, column 4, line 17-18, and thickness of the pad / projection is determined by bonding requirements, stand off clearance and pad forming methods, column 4, line 29-31.

A person of ordinary skill in the art will select the projection depending upon the specific application to have desired stand off clearance.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the wiring pattern of Hugle with projecting electrodes, as taught by Galli, in order to have desired stand off clearance.

7. Claims 14 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hugle and Galli as applied to claim 12 above, and further in view of Nogawa et al., US Patent No. 4,316,320, hereafter, Nogawa.

Regarding claim 14, the applicant is claiming a first wiring pattern formed on one side of the insulating substrate and a second wiring pattern formed on an opposite side of the insulating substrate.

Hugle fails to disclose the wiring pattern on both the sides of the insulating substrate.

Nogawa discloses a flexible wiring board with wiring pattern on both the sides of the insulating substrate with flat electrodes, see figure 1, column 2, line 49-60.

Further, wiring on both the sides of the substrate is used in the art for increasing the component density on the board or connecting component on one side and the wiring with electrodes on the other side used for subsequent connection of the board to the other board in the system, depending upon the system requirements.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the combination of Hugle and Galli with a second wiring pattern with electrodes formed on an opposite side of the insulating

substrate, as taught by Nogawa, in order to have subsequent connection of the board with other circuit board depending upon the system requirement.

Regarding claim 16, the combination of Hugle, Galli and Nogawa further disclose the second wiring pattern having flat pattern, as applied to claim 14 above.

8. Claims 2, 4, 13 and 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmerman, US Patent No. 4,048,438, in view of Forehand et al., US Patent No. 5,710,063, hereafter, Forehand and Castro, US Patent No. 6,534,861.

Regarding claim 2, Zimmerman discloses a flexible wiring board comprising a wiring pattern formed of a desired metal on an insulating substrate (conductive pattern on a flexible substrate 10 with lead fingers 16, see figure 1, column 3, line 54-67), and a reinforcing guide pattern on the insulating substrate, wherein the reinforcing guide pattern is of the same metal as that of the wiring pattern (conductor pattern 14, see figure 1, column 3, line 54-67), but

fails to disclose the reinforcing guide pattern has guide holes for positioning.

Forehand discloses a tooling hole 211 for alignment and registration, which are nothing but guide holes for aligning the board.

Castro discloses tooling holes 126 on each of the circuit boards (figures 1 and 5) for aligning the board in subsequent processing together with alignment fiducial 128, see column 5, line 23-25.

A person of ordinary skill in the art will be motivated to provide the guide holes on the individual circuits for properly aligning the component in subsequent processing.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the substrate of Zimmerman with guide pattern having holes for positioning from the teachings of Forehand and Castro, in order to properly locate the component in subsequent processing or to properly fix the board on bed for automating placement of the component.

Regarding claim 4, the flexible wiring board of Zimmerman further discloses the guide pattern formed as a frame shape surrounding the periphery of the wiring pattern (pattern 14, see figure 1).

Regarding claim 13, the flexible wiring board of Zimmerman further discloses the flat electrodes, see figure 2.

Regarding claim 17, the flexible wiring board of Zimmerman further discloses the reinforcing guiding pattern formed integral with the wiring pattern on the insulating substrate (see figure 1).

9. Claims 3, 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Zimmerman, Forehand and Castro, as applied to claims 2,4, 13 and 17 above, and further in view of Tsukamoto, US Patent No. 5,841,194.

Regarding claim 3, the applicant is claiming the guide pattern with a projecting reinforcing guide having a thickness greater than that of the wiring pattern.

Zimmerman fails to disclose projecting reinforcing guide patterns having a thickness greater than that of the wiring pattern.

Tsukamoto discloses a guide frame patterns thicker than the wiring pattern (metal stiffener 106 with thickness greater than the wiring pattern, to have necessary strength required for better handling of the assembly and to avoid damage to the wiring patterns and also to use as a heat dissipating media and further discloses electrodes on both the side of the board, which can be used for subsequent connection of board with other circuit board or for connecting the component on the other side, depending upon the specific applications.

A person of ordinary skill in the art will be motivated to use the thicker guide pattern to have the desired strength during handling as well as a protection to the component wherein the component height is smaller than that of the guide pattern.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the substrate of the combination of Zimmerman, Forehand and Castro with a projecting reinforcing guide pattern having a thickness greater than that of the wiring pattern, from the teaching of Tsukamoto, in order to have necessary strength to avoid the damage during handling and assembly.

Regarding claim 5, the modified circuit board of Zimmerman further discloses the guide pattern formed as a frame shape surrounding the periphery of the wiring pattern; see Zimmerman figure 1 and Tsukamoto figure 1 and 2.

Regarding claims 8, the modified circuit board of Zimmerman discloses the guide holes for positioning as applied to claim 2 above.

10. Claims 13, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Zimmerman, Forehand, Castro and Tsukamoto, as applied to claims 2-5 and 8 above, and further in view of Beck, US Patent No. 3,466,206.

Regarding claims 13, the applicant is claiming projecting electrodes.

The modified circuit board of Zimmerman fails to disclose the projecting electrode.

Beck discloses projecting electrodes (terminals) on both the sides of the board to embed the circuit traces and keeping the top of the terminals exposed for the connection.

Further, the projecting electrodes will help in keeping the desired gap between the component and the board.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the modified circuit board of Zimmerman with projecting electrodes in order to have desired spacing between the component and the substrate surface and also if required to embed the traces, leaving the electrodes exposed.

Regarding claims 14, the modified circuit board of Zimmerman further discloses the second wiring pattern on the opposite side of the insulating substrate as applied to claim 3 and 13 above.

Regarding claim 16, the modified circuit board of Zimmerman further discloses the second wiring pattern has flat electrodes, as disclosed by Tsukamoto and applied to claim 3 above.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sawai Hiroyuki discloses an interposer with reinforcing pattern in the lattice form on the periphery of the circuit board.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (8:30 - 5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308 1233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305 3900.

ibp
10/17/03

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